Please amend the following claims:

In each of the claims 8, 14-15, 17-21, 23-25 and 30-38, 40-48, and 53-63, line 1, after "bipolar" insert –separator--.

1.(Amended) A bipolar separator plate for electrochemical cells, comprising:

a gas barrier having an electrically conducting pathway extending therethrough, wherein the gas barrier comprises a polymer;

a porous, electrically conducting member in electrical contact with each side of the electrically conducting pathway, the member selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof; [and

a flowfield formed in] wherein the porous, electrically conducting member forms a fluid flowfield.

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7.(Amended) A bipolar separator plate for electrochemical cells, comprising:

a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within pores of the sheet to form a gas barrier that prevents communication of gas between opposing faces of the sheet; and

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in one or more faces of the sheet].



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19. (Amended) A bipolar separator plate for electrochemical cells, comprising:

a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within the sheet to form a gas barrier, wherein the gas impermeable material is a polymer selected from the group consisting of water permeable polymers, thermoplastic polymers, reactively cured polymers, and combinations thereof; and

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in the sheet].

21 10. (Amended) A bipolar separator plate for electrochemical cells, comprising:

E3 a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within a portion of the sheet to form a gas barrier, wherein the gas impermeable material is an epoxy; and

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in the sheet].

23 11. (Amended) A bipolar separator plate for electrochemical cells, comprising:

a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within a portion of the sheet to form a gas barrier, wherein the gas impermeable material is a thermoplastic polymer selected from the group consisting of polyethersulfone (PES), nylon, and polycarbonate; and

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in the sheet].

[3]

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~~12~~. (Amended) A bipolar separator plate for electrochemical cells, comprising:

a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within a portion of the sheet to form a gas barrier, wherein the gas impermeable material is a perfluorinated [sulfonic acid] sulfonate polymer; and

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in the sheet].

~~13~~. (Amended) The bipolar separator plate of claim ~~13~~, wherein the [gas impermeable material] thin metal sheet is selected from the group consisting of titanium, stainless steel, aluminum, magnesium, [and] alloys thereof, and noble metal or gold-plated titanium.

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~~16~~.(Amended) A bipolar separator plate for electrochemical cells, comprising:

a porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof;

a gas impermeable material disposed within a portion of the sheet to form a gas barrier, wherein the gas impermeable material is disposed within a face of the sheet;

wherein the porous, electrically conducting sheet forms a fluid flowfield [formed in the sheet]; and

a second porous, electrically conducting sheet selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof, wherein the second porous sheet is in electrical contact with the face of the porous sheet having the gas barrier.

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~~22~~.(Amended) The bipolar separator plate of claim ~~21~~, wherein the metal sheet is selected from titanium, stainless steel, aluminum, magnesium, and alloys thereof.

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E6 14 ~~39~~. (Amended) The bipolar separator plate of claim ~~37~~ 10, wherein [a] the fluid flowfield is formed by the [open] pores in the porous electrically conducting sheet.

F7 53 ~~49~~. (Amended) The bipolar separator plate of claim ~~36~~ 48, wherein the gas impermeable material is a perfluorinated [sulfonic acid] sulfonate polymer.

37 ~~51~~.(Amended) The bipolar separator plate of claim ~~21~~ 30, wherein the metal sheet is [selected from] titanium, [nickel,] stainless steel, aluminum, magnesium, [gold] or combinations thereof.

F8

54 ~~52~~.(Amended) The bipolar separator plate of claim ~~36~~ 48, wherein the gas impermeable material is [selected from] titanium, [nickel,] stainless steel, aluminum, magnesium, [gold] or combinations thereof.

Please enter the following new claims:

59 ~~64~~. A bipolar separator plate for electrochemical cells, comprising:

a thin metal sheet gas barrier; and

first and second porous, electrically conducting flowfields secured in electrical contact with opposing sides of the gas barrier, wherein the electrically conducting flowfields are selected from the group consisting of expanded metal mesh, metal foam, conducting polymer foam, porous conductive carbon material and combinations thereof.

F9

60 ~~65~~. The bipolar separator plate of claim ~~64~~ 59, wherein the first porous, electrically conducting flowfield is metal foam selected from copper, aluminum, nickel, titanium, silver, and stainless steel.

61 ~~66~~. The bipolar separator plate of claim ~~65~~ 60, wherein the metal foam has a density between about 3 and about 50 percent metal.

67. The bipolar separator plate of claim 65, wherein the metal foam is plated with gold or a noble metal.

68. The bipolar separator plate of claim 64, wherein the first porous, electrically conducting flowfield is metal mesh selected from titanium, stainless steel, aluminum, magnesium, and alloys thereof.

69. The bipolar separator plate of claim 68, wherein the metal mesh is plated with gold or a noble metal.

70. The bipolar separator plate of claim 64, wherein the first and second porous, electrically conducting flowfields ~~comprise expanded metal mesh metallurgically~~ are bonded to the opposing sides of the thin metal sheet gas barrier.

71. The bipolar separator plate of claim 64, further comprising a frame secured to the perimeter of the flowfields and gas barrier.

72. The bipolar separator plate of claim 71, further comprising gaskets between adjacent cell components.

73. The bipolar separator plate of claim 71, wherein the gas impermeable material is a thin metal sheet.

74. The bipolar separator plate of claim 21, wherein the metal sheet is plated with gold or a noble metal.

75. The bipolar separator plate of claim 65, wherein the second porous, electrically conducting flowfield is metal foam selected from copper, aluminum, nickel, titanium, silver, and stainless steel.